

## CLAIMS:

1. A cathode ray tube provided with at least one oxide cathode comprising a cathode carrier with a cathode base of a cathode metal and a cathode coating of an electron-emitting material containing a particle-particle composite material of oxide particles of an alkaline earth oxide selected from the group formed by the oxides of calcium, strontium and barium, and oxide particles having a first grain size distribution of an oxide selected from the group formed by the oxides of scandium, yttrium and the lanthanoids, and oxide particles having a second grain size distribution of an oxide selected from the group formed by the oxides of scandium, yttrium and the lanthanoids.
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- 10 2. A cathode ray tube as claimed in claim 1, characterized in that the oxide particles having a first grain size distribution have an average grain size  $0.4 < d_{50} < 5 \mu\text{m}$ , and the oxide particles having a second grain size distribution have an average grain size  $d_{50} \leq 0.4 \mu\text{m}$ .
- 15 3. A cathode ray tube as claimed in claim 1, characterized in that the electron-emitting material comprises the oxide particles having a first grain size distribution in a concentration in the range from 0.1 to 20 wt.%, and the oxide particles having a second grain size distribution in a concentration in the range from  $1*10^{-6}$  to  $1*10^{-3}$  wt.%.
- 20 4. A cathode ray tube as claimed in claim 1, characterized in that the oxide particles of an alkaline earth oxide selected from the group formed by the oxides of calcium, strontium and barium are doped with an element selected from the group formed by scandium, yttrium and the lanthanoids in a quantity ranging from  $0.10*10^{-6}$  to  $10*10^{-6}$  wt.%.
- 25 5. A cathode ray tube as claimed in claim 1, characterized in that the electron-emitting material is a stratified composite of at least a first and at least a second layer, said first layer comprising oxide particles of an alkaline earth oxide selected from the group formed by the oxides of calcium, strontium and barium, and oxide particles having a first grain size distribution of an oxide selected from the group formed by the oxides of scandium,

yttrium and the lanthanoids, and said second layer comprising oxide particles of an alkaline earth oxide selected from the group formed by the oxides of calcium, strontium and barium, and oxide particles having a second grain size distribution of an oxide selected from the group formed by the oxides of scandium, yttrium and the lanthanoids.

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6. A cathode ray tube as claimed in claim 1, characterized in that the electron-emitting material is a stratified composite of at least a first and at least a second layer, said first layer comprising oxide particles of an alkaline earth oxide selected from the group formed by the oxides of calcium, strontium and barium, and oxide particles of an oxide selected from the group formed by the oxides of scandium, yttrium and the lanthanoids having a first or a second grain size distribution in a quantity ranging from 2 to 20 wt.%, and said second layer comprising oxide particles of an alkaline earth oxide selected from the group formed by the oxides of calcium, strontium and barium, and oxide particles of an oxide selected from the group formed by the oxides of scandium, yttrium and the lanthanoids having a first or a second grain size distribution in a quantity ranging from 0.1 to 5 wt.%.

7. A cathode ray tube as claimed in claim 1, characterized in that the electron-emitting material comprises 1 to 3 wt.% particles of an activator metal selected from the group formed by Mg, Al, Fe, Si, Ti, Hf, Zr, W, Mo, Mn and Cr.

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8. A cathode ray tube as claimed in claim 1, characterized in that the electron-emitting material comprises 1 to 3 wt.% particles of an activator metal selected from the group formed by Mg, Al, Fe, Si, Ti, Hf, Zr, W, Mo, Mn and Cr, which are coated with a metal selected from the group formed by Pd, Rh, Pt, Co, Ni, Ir, Re.

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9. An oxide cathode comprising a cathode carrier with a cathode base of a cathode metal and a cathode coating of an electron-emitting material comprising a particle-particle composite material of oxide particles of an alkaline earth oxide selected from the group formed by the oxides of calcium, strontium and barium, and oxide particles having a first grain size distribution of an oxide selected from the group formed by the oxides of scandium, yttrium and the lanthanoids, and oxide particles having a second grain size distribution of an oxide selected from the group formed by the oxides of scandium, yttrium and the lanthanoids.